

**Original article**

**Association between Puberty, Bulimia Nervosa and Depression**

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**Abstract**

**Background:** Anorexia Nervosa (AN) and Bulimia Nervosa (BN) are diseases characterized by an eating disorder, distorted weight regulation and distorted perception of one's body. In the period of puberty adolescents are becoming increasingly vulnerable to eating disorders.

**Objective:** The target of this study was to examine the prevalence of possible eating disorder (bulimia nervosa) and depression in the period of puberty. **Methods:** The study group included 233 students from secondary schools, of whom 128 were boys and 105 girls, with an average mean age of 14 years. The Eating Attitude Test (EAT-26) and Children's Depression Inventory (CDI) were applied to the entire study population. Also we calculate the Body Mass Index (BMI); a parameter defines as the ratio of human body weight and height. **Results:** According to the EAT, 73 (32%) students had a EAT score indicating a possible diagnosis of bulimia nervosa. The authors observed statistically significant increased frequency of depressive thoughts in the study group. 188 (81%) students had emotional symptoms of depression. Correlation results indicated that depressed mood scores positively correlated with bulimia scores. **Conclusions:** We observed high prevalence of bulimia nervosa and depression in the period of puberty.

**Keywords:** adolescents; BMI; bulimia nervosa; depression; psychiatric morbidity

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**Introduction:**

Adolescence is a period which is characterized by significant physical, emotional and intellectual changes. This is a period of growth which is characterized by the change in body proportion, size, weight and body image, development of sexuality and reproductive functions. These changes are a normal transition from childhood to adulthood. But adolescents are experiencing these changes in different ways.

During puberty, most of the adolescents feel out of control with their body. At this stage, they are no children, but they are young people who keeping up with the transition can be a change. This is not new that more development changes occur during puberty, that in only other life stage. Also the puberty starts earlier now than ever before.

The young person thinks: "What is happening with my body?" To answer of this question will help him/her

to know about and understand these changes before they occur. Also it is very important to recognize that no two people are exactly alike, puberty comes at different

times for everyone<sup>1</sup>. In this period of their life many adolescents, because of their stage of cognitive development, lack the psychological capacity to express abstract concepts such as self – awareness, motivation to lose weight or feeling depression<sup>2</sup>.

Depression always goes hand – in – hand with some kind of eating disorders, like anorexia nervosa and bulimia nervosa<sup>3</sup>.

Eating problems are common in children and adolescents, and eating disorders typically have their onset during these developmental periods. Anorexia nervosa is a serious and potentially life-threatening disorder associated with food restriction, malnutrition and distorted thinking about body shape and weight. On the other side bulimia is

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more frequent than anorexia, with prevalence at 90 to 95% among females<sup>4</sup>. Bulimia nervosa is complex illness affecting adolescent with increasing frequency. It is characterized by period of restriction followed by binge eating and purging behaviors (vomiting, laxative use) and often begins during early adolescence (ages 15 to 17 years). This kind of eating disorder is associated with serious biological, psychological and sociological morbidity<sup>5</sup>.

There are several psychological hypotheses that attempt to explain indication as an etiologic factor of bulimia nervosa. Psychiatrists and psychologists think that this kind of eating disorder is more prevalent in industrial countries, in the family with conflicts, social isolation and emotional deficit.

In the last few years, many researchers have focused their attention on the study of the relationship between depressive symptoms and eating disorder in period of adolescents<sup>6-8</sup>. Studies emphasize a frequent association between bulimia nervosa and depression as psychiatric conditions. The young person feels sad, lonely, empty and isolated. To our knowledge this is one of the first studies in which the relationships between the bulimia nervosa and symptoms of depression have been investigated in our population.

**Aims of research:**

The aim of the present study is to investigate the correlation between bulimia nervosa and depression in period of adolescence. To achieve this aim, the following goals are pursued:

To classify adolescents by their Body mass Index (BMI) – how BMI varies in period of puberty;

To estimate the magnitude of bulimic problems among boys and girls;

To find out the relation between bulimia nervosa ad level of depression in period of puberty.

**Material and methods:**

***Participants***

The participants in this study were 233 8<sup>th</sup> – grade basic general education students, of whom 128 were boys and 105 girls with an average mean age of 14, 6 years. The undergraduate students who volunteered to participate in the study were explained about the purpose of the study and implications. The students were assured anonymity and were told to respond honestly. The questionnaires were administered collectively in the participants’ classrooms. Finally, height and weight measurements were taken of all participants.

***Instruments***

The Eating Attitudes Test (EA-26) is probably the

most widely used standardized self-report measure of symptoms and concerns characteristic of eating disorder<sup>9</sup>. This test is good at detecting clinical cases in high-risk populations and identifying individuals with an abnormal occupation with their diet and weight<sup>10</sup>. EAT-26 is a 26–item self-report instrument. Items are presented in a 6-point forced choice Linker scale ranging from 1 (“never”) to 6 (“always”). The EAT-26 total score ranges from 0 to 78. The score equal between 13 and 19 corresponds with normal weight, but the score greater than 20 corresponds to a possible diagnosis of bulimia. Cronbach’s reliability for EAT-26 was 0.789, so the questionnaire has been validated for the local settings.

In addition to the EAT-26, participants completed the Children’s Depression Inventory (CDI), which is a commonly used self-report measure of the depression symptoms in children and adolescents ages 7 to 17. The scale has 27 items dealing sadness, self-blame, loss of appetite, interpersonal relationships and school adjustment<sup>11</sup>. CDI items have to be scored on three-point scales with 0, 1 or 2 with higher scores indicative of more severe depression. CDI has been found to have adequate internal consistency (Cronbach’s  $\alpha=0.88$ ).

Finally, height and weight measurements were also taken of all participants in order to estimate the Body Mass Index (BMI= $\text{kg}/\text{m}^2$ ) to confirm the diagnosis of Bulimia.

The collected data were coded and imported into a statistical program (SPSS version 17). The basis statistical analysis and interpretation were made using the same program.

**Results:**

This clinical research studied 233 adolescents, 128 boys and 105 girls. As shown in table 1 the majority of participants (121) had BMI values within the range of 18.5-25 $\text{kg}/\text{m}^2$ , while nine students have a BMI of less than 18.5 $\text{kg}/\text{m}^2$  and 95(42%) had BMI over 25 $\text{kg}/\text{m}^2$ . It is clear that half of the surveyed students had problems with their weight.

**Table 1:** The BMI values of students

Body mass index-BMI (kg/m <sup>2</sup> )	N	%
< 18.5	17	7
between 18.5 – 25	121	51
> 25	95	42
Total	233	100

As to the Eating Attitude test (EAT-26) 73 students (32%) had a score equal to greater than 20, that is, these students probably have subclinical eating

disorder like as bulimia nervosa. From table 2 we can see that a great number of our participants are young subjects with excessive intake of food, with a sense of loss of control ever eating.

**Table 2:** Prevalence of students according to EAT-26 scores.

EAT	N	%
< 13	14	6
between 13 - 19	146	62
> 20	73	32
Total	233	100

On the other hand most of the students in our study had negative emotions not only about their weight. In the study group the following results we obtained using the BDI survey: 45 students scored under 24 points indicating no clinically significant depressive symptoms, 188 students scored above 24 points showing the presence of clinically significant depressive symptoms (Table 3).

**Table 3:** Prevalence of students according to CDI scores

CDI	N	%
< 24	45	19
between 25 - 35	179	76
between 36 - 45	9	5
>45	0	0
Total	233	100

A summary of descriptive statistics is given in Table 4. The mean average of BMI among students was 22.5 kg/m<sup>2</sup>. The average total score obtained on the EAT-26 was 20.8 points, with values ranging between 0 and 76 points. The mean CDI scores was 32 with range of 54 (0-54). The correlation of statistical significance by Pearson between BMI, bulimic symptoms and depression is at the level of 0.01.

**Table 4:** The correlation between BMI, EAT-26 and CDI

Descriptive statistics	Body mass index-BMI (kg/m <sup>2</sup> )	EAT - 26	CDI
N	233	233	233
Mean	22.5	20.8	32
Std. deviation	3.60	2.67	3.86
Pearson Correlation	1	0.784**	0.765**

\*\* . Correlation is significant at the 0.01 level

**Discussion:**

Among the mental disorders, eating disorders have gained exceptional importance in recent decades, as evidenced by the numerous studies related to these diseases. This interest is stimulated by the need to prevent; to early detect and to effectively treat a group of disorders that affect a large population sector. A variety of factors including personality, genetic inheritance, neurobiological alteration and the mass media’s portrayal of thinness as an attractive quality, all play a role<sup>12, 13</sup>. However the number of adolescents displaying eating disorder decreased from the beginning of the year to the end.

Anorexia nervosa and bulimia nervosa often are chronic eating disorders associated with high co morbidity. Researchers found increase disordered eating behaviors and depression among adolescents who had bulimic problems<sup>14</sup>. There is inconsistent findings concerning the relationship between obesity and depression. Some studies included that there was no relation between obesity and depression<sup>15</sup>, while others reported that obese people had higher risk of depression<sup>16</sup>. Goodman and Whitaker showed that depressed adolescents are at increased risk to the development and persistence of obesity later in their life. They concluded that depression in adolescence was positively associated with body mass index during adulthood. Also they thought that psychological distresses caused by obesity may lead to depression.

In this paper we tried to find the relation between BMI, EAT-26 and CDI in a sample of 233 boys and girls in period of puberty. We found that overweight and obesity in adolescents of secondary school are on the increase. Research among students has suggested that the EAT-26 is an internally consistent scale with an alpha coefficient of 0.765. A score greater than 20 is considered to be an indicator of a possible eating disorder.

Also results of our analyses indicate that BMI and depression are associated. In general, it can be concluded that higher BMI may result in more severe forms of depression. The depression of adolescents refers to a set of emotions and behaviors such as sadness, unhappiness, blue feelings, poor appetite, insomnia<sup>18, 19</sup>. It is known that adolescent depression in this case is associated with their psychological difficulties about their overweight and obesity. Adolescents may present significant difficulties related to eating, body image and weight control habits. The young people who believe they are overweight prior to puberty may be at risk for the

development of disordered eating, related problems and depression mood.

The family often plays a big role in whether a person develops an eating disorder. Negative family influences such as being teased about appearance, overly critical parents and siblings and pressure to be thin are all risk factor. Studies and research also show that eating disorders (anorexia nervosa or bulimia nervosa) are more prevalence in people who had one or more parents who were overprotective, detached and critical with their children. Given that adolescents with eating disorder usually live at home and interact with their families on a daily basis, the role of family should be explored during both evaluation and treatment, with particular given to the issues of control and responsibility for the adolescent within the family context.

### **Conclusion:**

From the results of this research this paper can be considered among the first works of its kind in the region of the Republic of Macedonia and its connection with determining the correlation between obesity and depression. The results indicate a high level of depressed emotions and dissatisfaction with their figure among adolescents. Further research is needed to better understand the structure of such complexity. This research showed that obesity and depression are associated, but maybe the form of the relation is different among boys and girls.

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